CLAIMS

1. A method of forming a polymeric nanocomposite material comprising:

providing a nanosize material;

combining said nanosize material with a solvent to form a solution mixture;

adding a polymer to said solution mixture to form a substantially homogeneous mixture; and

removing said solvent from said mixture.

2. The method of claim 1 wherein said nanosize material is selected from the group consisting of vapor grown carbon nanofibers, carbon nanotubes, layered silicates, nanosize sphered silica, and graphite nanoparticles.

3. The method of claim 1 in which said solvent is removed by evaporation.

4. The method of claim 1 in which said solvent is removed by coagulation.

5. The method of claim 1 in which said polymer is selected from the group consisting of polyurethanes, polyolefins, polyamides, polyimides, epoxy resins, silicone resins, polycarbonate resins, acrylic resins, and aromatic-heterocyclic rigid-rod and ladder polymers.

6. The method of claim 1 in which said solvent is selected from the group consisting of dimethyl sulfoxide, tetrahydrofuran, acetone, methylene chloride, toluene, xylene, sulfuric acid, methanesulfonic acid, polyphosphoric acid, N,N-dimethyl acetamide, butyl acetate, and mixtures thereof.

7. The method of claim 2 in which said vapor grown carbon nanofibers are selected from the group consisting of as-grown fibers, pyrolytically stripped fibers, and heat treated fibers.

8. The method of claim 2 wherein said carbon nanotubes comprise single-walled or multi-walled nanotubes.

9. The method of claim 1 including adding a dispersing agent to said solution mixture selected from the group consisting of oils, plasticizers, and surfactants.

10. The method of claim 1 including adding a curing agent after removing said solvent from said mixture.

11. The method of claim 10 wherein said curing agent is selected from the group consisting of amines and metallic catalysts.

12. A method of forming a polymeric nanocomposite material comprising:

providing a nanosize material selected from nanosize sphered silica and layered silicates;

providing a polymer comprising a thermoplastic or thermosetting resin;

combining said nanosize material and said polymer with a solvent to form a substantially homogeneous mixture; and

removing said solvent from said mixture.

13. The method of claim 12 wherein said thermoplastic or thermosetting resin is selected from the group consisting of epoxies, silicones, polyolefins, polycarbonates, and acrylics.

14. The method of claim 12 including adding a curing agent after removing said solvent from said mixture.

15. The method of claim 14 wherein said curing agent is selected from the group consisting of amines and metallic catalysts.

16. The method of claim 12 wherein said solvent is removed by evaporation.

17. The method of claim 12 including adding a dispersing agent selected from the group consisting of oils, plasticizers, and surfactants when combining said nanosize material, polymer, and solvent.

18. A method of forming a polymeric nanocomposite material comprising:

providing a nanosize material;

providing a polymer;

combining said nanosize material and said polymer with a solvent to form a substantially homogeneous mixture; and

removing said solvent from said mixture.

19. The method of claim 18 wherein said nanosize material is selected from the group consisting of vapor grown carbon nanofibers, carbon nanotubes, layered silicates, nanosize sphered silica, and graphite nanoparticles.

20. The method of claim 18 wherein said polymer is selected from the group consisting of polyurethanes, polyolefins, polyamides, polyimides, epoxy resins, silicone resins, polycarbonate resins, acrylic resins, and aromatic-heterocyclic rigid-rod and ladder polymers.